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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jong-Soo Baek

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THE NATH LAW GROUP
112 South West Street
Alexandria, VA 22314

EXAMINER

EOM, ROBERT J

ART UNIT

PAPER NUMBER

1772

MAIL DATE

DELIVERY MODE

04/29/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,784	BAEK ET AL.	
	Examiner	Art Unit	
	ROBERT EOM	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 12 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 12 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/30/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-5, 12, and 17 have been considered but are moot in view of the new ground(s) of rejection.

The Applicants have made substantial amendments to the claims to further define the structural components and their related arrangements of the real-time monitoring apparatus, not previously presented for consideration upon merits for patentability.

2. Applicant's arguments filed 11/24/2010 have been fully considered but they are not persuasive.

The Applicants allege the basic configurations of De Maeyer and the Applicants' claimed apparatus are structurally and functionally different from one another, particular emphasis is placed on the contrasting number of photodetectors and excitation units. It is noted that the features upon which applicant relies (i.e., a single excitation unit and only one photo detector) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Additionally, it has been held that the mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

The Applicants allege the light pipe of De Maeyer is substantially distinct from the light wave guide as recited in the Applicants' claims, particular emphasis is placed on

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the need for the light pipe to be as large as that of the actual reaction plate, for example, a 96-well plate, which is allegedly not technically achievable. Assuming *arguendo*, it is noted that the Applicants' recited claims fail to recite or suggest any structural particulars regarding the size of the reaction plate. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Additionally, it is the position of the examiner that it well within the capabilities of one having ordinary skill in the art to incorporate a projecting or diverging lens into the light irradiation source in order to scale the source to whatever size reaction plate being used.

The Applicants allege the roles of the light waveguide as claimed by Applicants and the light pipe of De Maeyer are fundamentally different as the light pipe of De Maeyer is used simply for light transmission, while the light waveguide as claimed by Applicants is used to provide uniform light intensity. The Applicants are advised that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. As the combination of Applicant's Admitted Prior Art and De Maeyer teaches each and every structural component recited within the Applicants' claims, it is the position of the examiner that the light pipe of De Maeyer is fully capable of providing for uniform light intensity. Additionally, the structural particulars of the Applicant's waveguide which provides for the "uniform two-dimensional light source" are not recited in the rejected claim(s). Although the claims

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are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-5, 12, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claims 1, 12, and 17:

The limitation “an optical waveguide which has an open structure with said reflective mirror” in lines 9 and 10 is indefinite because it is unclear as to whether the “at least one reflective mirror” is a separate component or a part of the “optical waveguide”.

Limitations intended to disclose the particular arrangement of the structural components of the device in relation to one another are recited and arranged in a confusing manner. As such, aside from being positioned between the "light irradiation source" and the "receiving part", the particular structural arrangement of the device cannot be ascertained from the claim language.

It is strongly recommended that the Applicants amend the claims in a manner similar to the following: "A real-time monitoring apparatus for biochemical reaction comprising: (*List Light Irradiation Source Components*), (*List Temperature Control Block*

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Components), and (*List Optical System Components*) being arranged and configured so that light will travel through the components of the device in the above listed order”

Amendments are required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-5, 12, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (referred herein as AAPA, see: Fig. 2 and Fig. 5), in view of De Maeyer et al. (USP 4,076,420, referred herein as Maeyer).

Regarding claims 1, 2, 12, and 17, AAPA discloses a real-time monitoring apparatus for biochemical reaction (**Fig. 2**) comprising: a temperature control block comprising a thermoelectric element (**2**) and a heat transmission block (**3**) which supply heat into a plurality of reaction tubes (**4**); a light irradiation source comprising a lamp with a first ellipsoidal reflecting mirror or a parabolic mirror (**5**), a selective transmission filter (**14**), two reflective mirrors (**18**), and a condensing lens (**17**); and an optical system comprising a receiving part (**12**).

AAPA does not explicitly disclose a rectangular or round optical waveguide, a first and second focusing lens, or an infra-red cutting filter.

Maeyer teaches an apparatus for investigating fast chemical reactions by optical detection the light irradiation source comprising an optical waveguide (**Fig. 3**) comprising: a light source (**Q**) which provides light which is focused with a series of lenses (**L5 and L9**), passed through a monochromator (**M**) (which is analogous to an infra-red cutting filter as it can be configured to isolate any narrow spectral band), passed through a flexible light pipe (**G**), directed through a series of optics to the cell chamber (**K**), and then detected with a series of detectors (**D**). It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a

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focusing lens, monochromator, and waveguide into the monitoring apparatus of AAPA, as taught by Maeyer, since doing so provides for light from the light source to be fit to the shape of the entrance aperture of the sample cells (**C9/L31-34**).

Regarding claim 3, modified AAPA discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the refractive index of medium of the optical waveguide is 1.35 ~ 2.0. As the phase velocity is a variable that can be modified by adjusting the said refractive index, with said phase velocity decreasing as the refractive index is increased, the precise refractive index would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed refractive index cannot be considered critical. Accordingly one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the refractive index of modified AAPA to obtain the desired phase velocity (In re Boesch, 617 F2D. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (In re Aller, 105 USPQ 223).

Regarding claims 4 and 5, modified AAPA discloses all of the claim limitations as set forth above. While, modified AAPA does not explicitly disclose the particular shape of the optical waveguide having a rectangular or round shape, Maeyer discloses that the rectangular cross section of the light may be transformed into a round one to correspond to the shape of the sample cell entrance aperture (**C9/L31-34**). Therefore, it

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would have been obvious to one having ordinary skill in the art at the time of the invention to select the appropriately shaped waveguide (circular, rectangular, etc.) to provide for a light cross section which corresponds to the cross section of the aperture of the sample cell, whether round or rectangular.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Insuk Bullock can be reached on (571)272-5944. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. E./
Examiner, Art Unit 1772

/In Suk Bullock/
Supervisory Patent Examiner, Art Unit 1772